

**WHAT IS CLAIMED IS:**

1. An adaptive hybrid automatic repeat request method comprising:
  - (a) transmitting a data frame including a data bit and a parity bit that are  
5 channel-coded using a predetermined initial coding rate;
  - (b) receiving the data frame, performing channel decoding of the received data frame, and when an error exists in the channel-decoded data frame, correcting the error;
  - (c) when either there is no error in the channel-decoded data frame and when the error is corrected, transmitting an acknowledgement message to a transmitting terminal;
  - 10 (d) when the error of the channel-decoded data frame is not corrected, measuring an error degree of a corresponding frame and transmitting a negative acknowledgement message to which the measured error degree is added, to the transmitting terminal;
  - (e) transmitting a parity frame that is generated by performing channel coding of a parity bit corresponding to a parity level determined in accordance with the error degree  
15 added to the negative acknowledgement message; and
  - (f) combining the retransmitted parity bit with a data bit of a data frame in which error correction fails and performing channel decoding and error correction.
2. The method of claim 1, wherein in step (d), when a low density parity  
20 check code is used for the channel coding, the error degree of the frame is measured using a value of posterior probability of each data bit of the decoded data frame.
3. The method of claim 2, wherein the error degree is determined as an average value of an absolute difference between the value of posterior probability of each  
25 data bit of the frame in which error correction fails and a predetermined reference value.
4. The method of claim 3, wherein the predetermined reference value is 0.5.
5. The method of claim 1, wherein the parity level includes a parity number  
30 and a parity coding rate.

6. The method of claim 1, wherein in step (e), the parity level in accordance with the error degree is determined in consideration of a retransmission success probability and throughput.

5 7. The method of claim 1, further comprising:

(g) monitoring the error degree that is added to the negative acknowledgement message and transmitted to the transmitting terminal, for a predetermined amount of time and predicting a channel environment; and

10 (h) adjusting the initial coding rate in consideration of the predicted channel environment.

8. A method of transmitting data in an adaptive hybrid automatic repeat request system, the method comprising:

15 (a) transmitting a data frame including a data bit and a parity bit that are channel-coded using a predetermined initial coding rate; and

(b) retransmitting a parity frame that is generated by performing channel coding of a parity bit corresponding to a parity level determined in accordance with an error degree added to a negative acknowledgement message transmitted from a receiving terminal.

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9. The method of claim 8, further comprising:

(c) monitoring the error degree that is added to the negative acknowledgement message and transmitted to the transmitting terminal, for a predetermined amount of time and predicting a channel environment; and

25 (d) adjusting the predetermined initial coding rate in consideration of the predicted channel environment.

10. The method of claim 8, wherein in step (b), the parity level in accordance with the error degree is determined in consideration of a retransmission success probability and throughput.

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11. A method of receiving data in an adaptive hybrid automatic repeat request system, the method comprising:

(a) receiving a data frame transmitted from a transmitting terminal, performing channel decoding of the received data frame, and when an error exists in the channel-decoded data frame, correcting the error;

(b) when either there is no error in the channel-decoded data frame and when the error is corrected, transmitting an acknowledgement message to the transmitting terminal;

(c) when the error of the channel-decoded data frame is not corrected, measuring an error degree of the data frame transmitted from the transmitted terminal and transmitting a negative acknowledgement message to which the measured error degree is added, to the transmitting terminal; and

(d) combining a parity bit that corresponds to the negative acknowledgement message and is retransmitted from the transmitting terminal, with a data bit of the data frame transmitted from the transmitted terminal in which error correction fails, and performing channel decoding and error correction.

12. The method of claim 11, wherein in step (c), when a low density parity check code is used for the channel coding, the error degree of the frame is measured using a value of posterior probability of each data bit of the channel-decoded data frame.

13. The method of claim 12, wherein the error degree is determined as an average value of an absolute difference between the value of posterior probability of each data bit of the frame in which error correction fails and a predetermined reference value.

14. The method of claim 13, wherein the predetermined reference value is 0.5.

15. A computer readable recording medium in which a program for executing an adaptive hybrid automatic repeat request method is recorded, the method comprising:

(a) transmitting a data frame including a data bit and a parity bit that are channel-coded using a predetermined initial coding rate;

(b) receiving the data frame, performing channel decoding of the received data frame, and when an error exists in the channel-decoded data frame, correcting the error;

5 (c) when either there is no error in the channel-decoded data frame and when the error is corrected, transmitting an acknowledgement message to a transmitting terminal;

(d) when the error of the channel-decoded data frame is not corrected, measuring an error degree of the data frame transmitted from the transmitting terminal and transmitting a negative acknowledgement message to which the measured error degree is added, to the transmitting terminal;

(e) transmitting a parity frame that is generated by performing channel coding of a parity bit corresponding to a parity level determined in accordance with the error degree added to the negative acknowledgement message; and

15 (f) combining the retransmitted parity bit with a data bit of the data frame transmitted from the transmitting terminal, in which error correction fails and performing channel decoding and error correction.

16. A computer readable recording medium in which a program for executing the method of transmitting data in an adaptive hybrid automatic repeat request system is recorded, the method comprising:

(a) transmitting a data frame including a data bit and a parity bit that are channel-coded using a predetermined initial coding rate; and

(b) retransmitting a parity frame that is generated by performing channel coding of a parity bit corresponding to a parity level determined in accordance with an error degree added to a negative acknowledgement message transmitted from a receiving terminal.

17. A computer readable recording medium in which a program for executing the method of receiving data in an adaptive hybrid automatic repeat request system is recorded, the method comprising:

(a) receiving a data frame transmitted from a transmitting terminal, performing channel decoding of the received data frame, and when an error exists in the channel-decoded data frame, correcting the error;

(b) when either there is no error in the channel-decoded data frame and when the error is corrected, transmitting an acknowledgement message to the transmitting terminal;

(c) when the error of the channel-decoded data frame is not corrected, measuring an error degree of the data frame transmitted from the transmitting terminal and transmitting a negative acknowledgement message to which the measured error degree is added, to the transmitting terminal; and

(d) combining a parity bit that corresponds to the negative acknowledgement message and is retransmitted from the transmitting terminal, with a data bit of the data frame transmitted from the transmitting terminal, in which error correction fails and performing channel decoding and error correction.

18. An adaptive hybrid automatic repeat request apparatus comprising of:

a transmitter for transmitting a data frame including a data bit and a parity bit that are channel-coded using a predetermined initial coding rate, and retransmitting a parity frame that is generated by performing channel coding of a parity bit corresponding to a parity level determined in accordance with an error degree added to a negative acknowledgement message transmitted via a predetermined channel; and

a receiver for receiving the data frame transmitted from the transmitter, performing channel decoding of the received data frame, when there is no error in the channel-decoded data frame or the error is corrected, transmitting an acknowledgement message to the transmitter, when the error of the channel-decoded data frame is not corrected, measuring the error degree of a corresponding frame and transmitting a negative acknowledgement message to which the measured error degree is added, to the transmitter, combining a parity bit that corresponds to the negative acknowledgement message and is retransmitted from the transmitter, with a data bit of the data frame transmitted from the transmitting terminal, in which error correction fails and performing channel decoding and error correction.

19. The apparatus of claim 18, wherein the parity level in accordance with the error degree is determined in consideration of a retransmission success probability and throughput.

5           20. The apparatus of claim 18, wherein the error degree is determined as an average value of an absolute difference between the value of a posterior probability of each data bit of the frame in which error correction fails and a predetermined reference value.

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